

out into their communities, and assess and respond to community needs.² For instance, they point out that the infant mortality rate in Buffalo is among the highest in the United States, and they emphasize the need to increase preventive care and prenatal programs.

The system they describe may well fall short of its goal of improving the health of the community, however, if attention is not paid to integrating public health and medical care. Academic health centers have been called upon to broaden their horizons and add health promotion and disease prevention to their agenda. The 1992 annual meeting of the Association of Academic Health Centers was devoted to this subject, and the efforts of a number of such centers in this regard were described.⁵ Academic health centers need to form partnerships with health departments, community groups, schools,

churches, and other social agencies to address many of the underlying determinants of health. It is unlikely that the health indices of this country will be significantly improved if issues of substance abuse (including tobacco), teen pregnancy, violence, and acquired immunodeficiency syndrome are not addressed. To address them, however, will require increasing our understanding of all the conditions that contribute to adverse health behavior and of the approaches that can best mitigate or counteract those conditions.

Academic health centers can play an important role in this effort through research, program evaluation, and relevant education of health professionals. The Buffalo consortia have the opportunity and the database to evaluate the impact of their model, not just on the delivery system but also on the health of

the community. I hope we will hear more from them and others as we move to incorporate health promotion and disease prevention into our health care system to improve the health of the people. □

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The Academic Health Center and the Healthy Community

John Naughton, MD, and Joyce E. Vana, PhD

ABSTRACT

US medical care reflects the priorities and influence of academic health centers. This paper describes the leadership role assumed by one academic health center, the State University at Buffalo's School of Medicine and Biomedical Sciences and its eight affiliated hospitals, to serve its region by promoting shared governance in educating graduate physicians and in influencing the cost and quality of patient care. Cooperation among hospitals, health insurance payers, the business community, state government, and physicians helped establish priorities to meet community needs and reduce duplication of resources and services; to train more primary care physicians; to introduce shared governance into rural health care delivery; to develop a regional management information system; and to implement health policy. This approach, spearheaded by an academic health center without walls, may serve as a model for other academic health centers as they adapt to health care reform. (*Am J Public Health*. 1994;84:1071-1076)

Introduction

Medical care in the United States reflects the priorities and influence of academic health centers. Graduate medical education sets practice patterns for life and often functions as a professional compass for the practicing physician. Medical schools train physicians not only in the necessary clinical and research skills but also in the recognition and understanding of the social roots of health, illness, and access to medical care that define the healthy community. Academic health centers nationwide must provide major leadership in national health policy development and implementation.

Health care reform is forcing three essential changes in the education of graduate physicians: (1) Graduate medical education will need to conform in some measure to the needs of the country; that is, more generalist physicians and fewer technologically oriented specialists should be trained.¹⁻³ Generalist physicians can care for most presenting conditions and refer the more complicated problems to specialists. (2) A significant

part of this education will have to take place where people live and work—that is, in nonhospital settings such as community, inner-city, and rural sites; physicians' offices; retirement communities; and nursing homes. (3) Graduate medical education will have to seek out and respond to the needs of the larger community. The extent to which academic health centers respond to these challenges will determine the kind of health care this country provides its citizens in the 21st century. This paper describes the impact of one academic health center on the health care of the region it serves.

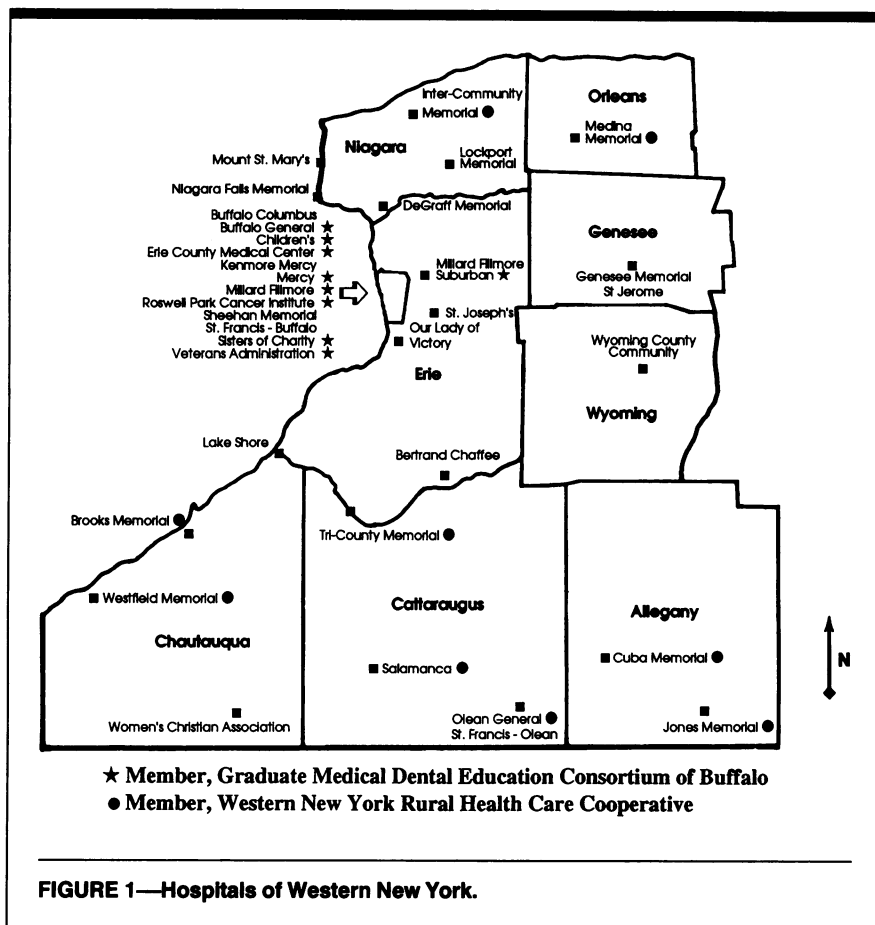
Academic Health Centers

There are at least 110 academic health centers in the United States. Each

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includes a medical school, one or more other health professional schools, and one or more teaching hospitals. In aggregate, the academic health centers educate most of the nation's health professionals, carry out a major part of biomedical research, participate in the care of 20% of the nation's hospitalized patients, and provide fully half of uncompensated hospital care.⁴

Those centers that own or operate a single university teaching hospital often focus on highly technological medicine, providing students with a "snapshot" of hospital care. Patients are usually very ill and often seen under acute circumstances. Care is often oriented toward sophisticated medical procedures; long-term follow-up care is rarely a part of this hospital medicine. The graduate and undergraduate student's "model for effective care becomes the specialist treating a patient who presents advanced symptoms of a condition that requires a specialist's care. What [these] students do not see is the continuity of care that begins and ends in the community."⁵ Thus, to educate physicians for the future, academic health centers must decentralize education and care and move out into their communities.

This is particularly important in New York State, which contains only 8% of the nation's population yet graduates 12% of American-trained medical students and 16% of the country's total graduate medical education pool.⁶

The University of Buffalo is in a unique position to effect the necessary changes in graduate medical education because it is so closely linked to its community. Its medical school opened nearly 150 years ago (in 1846) and affiliated with the two hospitals then existing, one Catholic and one nonsectarian. Throughout its history, the school has continued to use a network of affiliated hospitals. This arrangement has been sometimes divisive and always challenging, with conflicting loyalties and allegiances occasionally placing hospital service needs before medical education. However, mutual tolerance and dependence have also developed. The need to teach through a diverse hospital network has provided the medical school with a long history of responsiveness to the concerns of the larger community it serves and from which it draws support.

Today, the University of Buffalo's medical school is central to an academic

health center that includes the Schools of Dental Medicine, Nursing, Pharmacy, and Health Related Professions and eight affiliated teaching hospitals. The hospitals include tertiary and community hospitals, of which three are publicly supported, three are nonsectarian, and two are Catholic not-for-profit institutions (Figure 1). Two consortia have evolved to facilitate medical and dental education and health care delivery.

Governance by Consortia

The Graduate Medical Dental Education Consortium of Buffalo

The Graduate Medical Dental Education Consortium of Buffalo was formed in 1982 in response to new guidelines issued by the Accreditation Council for Graduate Medical Education that required governance of all graduate medical education programs by an institution of record.⁷ The University of Buffalo was faced with two alternatives: teaching through multiple different institutions of record, or creating one organization that comprised the teaching hospitals and the medical and dental schools. The institutions' leaders recognized the strength, economies, and potential of the latter alternative, and in 1983 the consortium was forged (Appendix).

Strong state support for consortial governance was forthcoming in 1984, when Gov Mario Cuomo appointed a Commission on Graduate Medical Education. The commission was subsequently succeeded by the New York State Council on Graduate Medical Education. In 1989 the council approved Buffalo's consortium as a demonstration model for graduate medical education in New York State.^{8,9}

The Graduate Medical Dental Education Consortium developed administrative and governing infrastructures with which to operate, cooperate, and succeed; it also developed bylaws and a written work plan. The early concerns were programmatic: the consortium addressed issues of responsibility and authority for curriculum development, program operation, and educational resource allocation in the residency programs. Today it plans and directs all Accreditation Council residency and fellowship training in Buffalo and western New York. Residency program directors have a common forum in which to review programs and develop cooperative approaches to strengthen graduate medical education. Final decisions on residency programs and alloca-

tion of house staff in the hospitals are made by the consortium's administrative committee. Resident credentialing is centralized together with record keeping for application forms, personnel files, diplomas, residency review submissions, and accreditation reports.

Financial issues were not an initial focus of the Buffalo consortium. In time, however, considerable financial control has been introduced and accepted. All direct and a portion of the indirect medical education funds to support graduate medical education were pooled into a single fund administered by the consortium. The hospitals involved contributed 10% of their indirect medical education funds to the pool in 1992, 15% in 1993, and will contribute 20% in 1994. Resident salaries and benefits are now equal for each training year level throughout the region and are paid by the consortium. As the pooled funds essentially comprise a portion of the insurance reimbursements to the hospitals, the health insurers (third-party payers)* as well as hospital chief financial officers are included in appropriate consortium committees and activities.

Western New York Health Sciences Consortium

Although organized for educational rather than financial reasons, the Buffalo consortium has had strong economic repercussions in the community. Foremost among these was the formation in 1987 of a second consortium, the Western New York Health Sciences Consortium, designed to apply cooperative governance to the system of hospital services. The business community was aware of rising health care costs and the fragmentation of health care delivery inherent in competing institutions, as well as of the important economic role that the medical school and teaching hospitals represented to the region. They were challenged by the potential for a coherent regional approach to the delivery of excellent health care presented by Buffalo's academic health center. Community leaders hoped to enlarge the region's patient base and research development and to spur commerce through the development of innovative ways to transfer technology to the marketplace. Consequently, the Western New York consortium includes leaders of the business community as well as members of the Buffalo consortium, and it operates through a series of task forces, whose members variously include full-

time and volunteer faculty, hospital board members and executives, and business leaders.

Buffalo, like many cities in the northeast, has declined as a major industrial center. Since 1950, white-collar and service industries have characterized its growth. Buffalo's fertility rate is among the lowest in the United States; its infant mortality rate is unfortunately among the highest. The proportion of its population over age 65 is also among the highest in the country. In 1987 the hospital system acute care bed capacity was overexpanded by 15%, and the ratio of physicians per population unit was 40% higher than the national norm. The region supported fourfold the optimum number of specialists. Regional needs, therefore, were for strong primary, prenatal, and preventive care programs; good geriatric and chronic disease care; fewer acute care hospital beds and more services outside of hospitals; and the cooperative, not competitive, development of high technology.

Interlocking Relationships

Together, these two consortia addressed the region's health education and patient care delivery problems. The Western New York consortium took steps to prioritize community needs and reduce duplication of resources and services. The Buffalo consortium took the initiative to train more generalist physicians, educate physicians in geriatric and chronic disease care, and promote ambulatory care settings. Both consortia are collaborating on an ambitious regionalized management information system. Health insurers, both consortia, and other health care agencies are involved in an ongoing dialogue to formulate health policy for the region. Priority decisions are made by everyone deliberating around a very large table. It works because the consortial memberships reflect the perspectives and objectives of academic medicine, clinical service, the business and political communities, and third-party payers, and because important fiscal resources are controlled through shared governance. This unique approach is being observed by the US General Accounting Office as a possible model for use in other communities, by the Clinton Task Force on Health Care Reform, by the congressional Physician Payment Review Commission, and by the New York State Council on Graduate Medical Education as a model for consideration by the 11 other medical schools in New York.

Assessment of Community Needs

The Western New York consortium addressed the problem of a rational distribution of specialty centers among consortium hospitals. Five major achievements can be reported:

1. It sanctioned only one hospital to apply for approval to operate the Upstate New York Heart-Lung Transplant Center, and it facilitated cooperation rather than competition with the private medical school of the University of Rochester, located 70 miles to the east. The result was state approval for a multi-institutional transplant center, with the Buffalo General Hospital designated as the site for the heart-lung transplant program and the University of Rochester and Strong Memorial Hospital designated as the site for the liver-pancreas transplant program. Both sites were approved to operate a 12-bed bone marrow transplant service, the Buffalo site being the Roswell Park Cancer Institute. Thus, two strong medical schools, one public (Buffalo) and one private (Rochester), cooperate in a model long encouraged by health policy analysts and planners.⁶

2. Burn and trauma services, once located in three hospitals, were relocated to one facility. A Level One Regional Trauma Center was established at the Erie County Medical Center, with a pediatric satellite in the Children's Hospital of Buffalo.

3. The introduction of positron emission tomography procedures in the region is another example of the responsible application of expensive technology. Health economists have encouraged academic health centers to become involved in determining the appropriate use of medical technology in patient care.¹⁰ In Buffalo, positron emission tomography represents a joint venture between the academic health center and the Veterans Administration Medical Center. The operation and financing of this facility is under the supervision of a Review Council for Clinical Positron Emission Tomography, appointed by the medical school dean. This council of physicians, hospital administrators, and health insurers is responsible for final approval of criteria

*The insurers include Blue Cross of Western New York, Blue Shield of Western New York, Medicaid, and two health maintenance organizations: Health Care Plan and Independent Health Association. (Blue Cross and Blue Shield have been one organization as of January 1, 1993.)

and protocols for use of the facility, based on studies of efficacy and cost-effectiveness.

4. The Western New York consortium worked cooperatively to improve the status and stature of the regional comprehensive cancer center, Roswell Park Cancer Institute, a New York State hospital. Enhancing the medical opportunities available through this cancer center was a paramount concern of the business community, as was development of the potential for technology transfer to the marketplace. However, the center needed community and professional strengthening. Through the mediation of the consortium, a clinical affiliation agreement was negotiated between the cancer center and the University of Buffalo; advantageous salary levels for medical staff were provided with the help of the executive branch and the legislature of New York State. Public support was marshaled through the Roswell Park Alliance, led by a group of public-minded citizens, and in 1992, the cancer center was awarded \$242 million by the New York State legislature for renovation and modernization.

5. In 1989, responding to an urgent community need, the hospital chief executive officers recommended to the consortia that the medical school establish an emergency medicine department. The school's faculty and administration responded affirmatively, and the consortia approved four of their hospitals to provide the clinical training. Today, an emergency medicine residency program has been accredited, and the first 10 residents will begin their training in July 1994.

Primary Care Initiative

In 1992, the New York State Department of Health and the Graduate Medical Dental Education Consortium of Buffalo joined in a demonstration project to meet regional needs to train more

generalist physicians as well as physicians expert in geriatric and chronic disease care. In this project, the Buffalo consortium is committed to (1) establish a 50%/50% balance between generalist and specialist residencies by 1994 (from the 35% level of primary care residencies in 1991); (2) increase residency training in geriatric and chronic disease care, acquired immunodeficiency syndrome, and ambulatory care settings; (3) achieve and maintain an enrollment of at least 11% minority and socially underrepresented physicians in the graduate medical education programs (the 1991 level was 9%); and (4) limit the number of residents trained in western New York to 750 per year.

The Buffalo consortium allocated indirect medical education funds to support the educational research projects.* In 1992 these funds approximated \$1 million; in 1993, \$1.5 million; and in 1994, \$2 million. The Primary Care Resource Center, a novel and innovative center staffed by faculty of the departments of family medicine, pediatrics, medicine, and social and preventive medicine, was established to implement and evaluate the generalist physician initiatives. These projects focus on recruiting and retaining residents, preparing faculty to serve as role models, training primary care faculty to perform research, developing appropriate teaching skills and proficiencies, and developing new ambulatory training sites and student preceptorship experiences.

The Buffalo consortium also agreed to study the extent to which key clinical and laboratory variables determine length of hospital stay and overall cost of an inpatient episode, two factors that influence hospital reimbursement rates. These results are of concern to all involved in the delivery of health care, and they will be reported in 1994.

Rural Health Care Initiatives

Another major initiative occurs in rural western New York, where health care is sparse and poverty is high. In 1986, the Department of Family Medicine responded to an urgent need for health care in a three-county rural area there that was in danger of closing its only hospital for lack of staff. A rural practice plan was established within a year with four recent graduates of the family medicine residency program locating at the hospital. Faculty members of the Department of Family Medicine rotated through the community in the early months to estab-

lish a community presence and to support the four new graduates. This rural practice site is now used for training primary care residents and nurses.¹¹

The rural health care initiative received fiscal support from the New York State legislature, which was impressed by the shared governance that included the medical, dental, and nursing schools; the community; and the local hospital.

Other responses to needs of the rural region have since developed:

1. An accredited family practice residency training track was established in another rural area and involves virtually the entire regional medical community. This "one-two" rural track entails 1 year in an urban tertiary hospital center and 2 years in a rural group practice. Referral to university clinics in all specialties is available to this rural population. Four weeks in this rural track is a required second-year rotation for all family medicine residents. This rural family medicine residency training site was the first to be established in New York State and the second in the nation.

2. An Office of Rural Health was opened for technical assistance, research, and training in rural health care initiatives. This office specifically responds to local initiatives to develop future practices, both independent and university affiliated.

3. A Western New York Rural Health Research Center was established to conduct relevant policy research.

4. The Western New York Rural Health Care Cooperative, a support network of rural hospitals, was formed in 1987 with support from the Robert Wood Johnson Foundation (Figure 1). The network formed an interhospital physician panel that focuses on quality assurance and on standards of patient care, issues of importance to rural physicians who often practice in professional isolation. Physician recruitment and nurse and other health-related professional training have been enhanced by joint and collaborative efforts.¹²

Management Information System

The consortia are organizing an information network that, when completed, will serve to seal this model of collaboration. Today the network provides selected diagnostic teleimaging consultations to outlying hospitals in the region and central coordination of resident and physician credentialing. Total

*On January 1, 1988, New York State initiated a diagnosis-related group prospective hospital reimbursement system. The new system required designation of 12 teaching hospitals as academic health centers. Identification of one teaching hospital in western New York ran counter to the consorcial arrangements established at the University of Buffalo and caused inequities in hospital reimbursements throughout the Buffalo consortium. Consequently, the consortium was designated the academic health center, and a rate enhancement was arranged to be funded by the non-Medicare payers to rectify the inequities. As part of this arrangement, the six participating hospitals agreed to contribute funds to the demonstration project pool from their indirect medical education revenues.

MEDLINE and other reference sources, full text material, and graphics can now be transmitted to students, residents, and physicians in the network of teaching hospitals. Importantly, the consortia also plan to establish a centralized composite database appropriate for social and behavioral science and for epidemiological, public health, and policy research.

Difficulties

Some of the cooperative attempts were neither immediately nor wholly successful. Unlike the efforts to regionalize specific treatment centers and certain technologies, efforts to consolidate and redistribute neonatal care and psychiatric services encountered serious conflict and disagreement before meaningful resolution occurred.

Neonatology

Reorganization of neonatal and obstetric care to avoid duplication of resources and services in the community was assigned a high priority. However, the efficient approach to organize and manage an integrated system through a regional center for tertiary neonatal and obstetric care was not readily accepted. Instead, the proposed coordinated approach resurrected historic rivalries, conflicts, and issues of community loyalties. Changes in leadership were eventually effected, and several years elapsed before a system was developed that used and coordinated the community resources well. Today, four consortium hospitals cooperate to provide integrated obstetric and neonatal care at three levels. The University of Buffalo has established a Division of Neonatology within Pediatrics and provides all neonatology pediatricians to the four hospitals. Medical students, residents, and nurses are trained in these four hospitals, and about 10 500 infants are served yearly.

Psychiatry

Similarly, effective collaboration between three of the consortium hospitals providing psychiatric care in western New York was stymied by administrative and personnel conflicts. Again, several years elapsed and leadership changes occurred before cooperation was established and regional centers for adolescent psychiatry, psychiatric liaison, and geropsychiatric services could be agreed upon.

Private Practice Physicians

Critically, many practicing physicians in the community remain concerned that

their traditional roles can be significantly modified by consortial governance. In a highly regulated state, physicians are threatened from many sides and are anxious that the autonomy they have worked so hard to achieve may be lost. This is being addressed by ongoing education and continued dialogue between the consortia and the practicing physicians. Its success remains to be determined. The active role of the business community in decision making was not universally accepted by either the practicing or academic medical community, but the initial successes of the Western New York consortium seem to justify its efforts. None of the differences has proved worthy of disbanding either consortium, and, on balance, consortia views have prevailed. Useful lessons have been learned. The Buffalo consortium consolidated around a common set of issues related to education, research, and service; for this, the leadership of the medical school was accepted. This was less true of the Western New York consortium. Although the disadvantages of a competitive health care model are recognized, there often is a very wide range of willingness to sacrifice individual and/or institutional advantage to the common weal.

Other Initiatives and New Directions

As the medical school is emphasizing education of generalists and developing educational models for their training, it is embarking on strengthening relationships with other health care workers' educational institutions, particularly the School of Nursing. These efforts will result in the nursing school's education of increased numbers of nurse practitioners. In future years, the education of physician's assistants will be introduced to the system. New models of education in which the role of the health care team will be emphasized are under development.

Another important initiative will be the facilitation of a manpower office designed to influence high school students' career choices, especially to undersupplied areas.

Conclusions

Recently, academic health centers were requested to evaluate their goals and objectives to include the health needs of the public.^{3,13} These admonitions are based on a long-range view that if the overwhelmingly publicly funded academic health centers do not address key popula-

tion health issues, their credibility, influence, and funding base may suffer. Risks of change are clear and real, but the benefits of graduating competent, sensitive health professionals aware of the social and economic roots of health and disease and of their personal roles and responsibilities to society may override them.

An academic health center can significantly and effectively affect the health care delivery in its region, particularly where the center operates from a consortium base of health care practitioners and educators, hospitals, health insurers, and community leaders. These propitious concepts of cooperative governance at the University of Buffalo developed from its particular record of affiliation with community and regional hospitals throughout its history, but the elements of this shared governance are present to some degree in every community with an academic health center.

In many instances what the University of Buffalo has achieved is not perceived as necessary by many other academic health centers. In Buffalo the need for collaboration in education, research, and service has proved stronger than the drive for autonomy. The collaboration was achieved voluntarily with assistance from policy changes from the Accreditation Council for Graduate Medical Education and participation of representatives of the New York State Department of Health and its Office of Health Systems Management. This academic health center is striving to be proactive, to anticipate community needs and policy decisions, and to plan for them, rather than to be reactive to crises and imposed regulations. □

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APPENDIX—The Graduate Medical Dental Education Consortium of Buffalo, 1983

Institution	Type
University of Buffalo School of Medicine and Biomedical Sciences	Public university
University of Buffalo School of Dental Medicine	Public university
Buffalo General Hospital	Private, nonsectarian
Millard Fillmore Hospitals	Private, nonsectarian
Children's Hospital of Buffalo	Private, nonsectarian
Sisters of Charity Hospital	Private, Catholic
Mercy Hospital	Private, Catholic
Erie County Medical Center	County government
Roswell Park Cancer Institute	New York State government
Veterans Administration Medical Center	Federal government